



DRIVEN-4 September 2023 Newsletter

Highlights from our DRIVEN-4 2023 Webinars

So far in 2023, we have held three (3) webinars. We truly enjoy the time we spend conveying our message to multiple industries, various companies and many key Manufacturing, IT and Engineering professionals. Sharing our expertise and experiences is something that we believe is an essential activity that helps us grow as a company and as a community of professionals. The interaction, questions, and sharing is what makes our industry better day in and day out. Utilizing our webinars as one of our chosen methods for distribution, we have focused on three main areas that we believe are key to organizations as they look to develop, improve and differentiate themselves from their competitors. In 2023 we have shared our experience on digitally transforming your company with the use of Product Lifecycle Management (PLM), Internet of Things (IoT) technologies and complimenting these offerings with our own DRIVEN-4 Connected Solution.

1. Going from PDM to PLM to drive your Digital Transformation

Digital Thread

A digital thread creates a closed-loop between the physical and digital worlds that spans the entire product lifecycle ensuring accurate product and process information is available:

to the right person → at the right time → and in the right context → across the extended value chain

HOW DIGITAL TRANSFORMS PHYSICAL

Defines Controls Manages Connects Sustains Augments

DIGITAL THREAD

The Digital transformation comes from expanding our thinking from Product Data Management (PDM) to a “holistic approach” that encompasses:

- Managing the Full Product Lifecycle
- Managing the Bill of Material and Product and Process Information from Engineering -> Manufacturing -> Service
- Utilizing Connected Processes from Design through Manufacturing and Service
- Connecting Digital Assets to Physical Assets as they are utilized in existing product and processes

DRIVEN-4 – PDM to PLM

PLM is a journey that needs to evolve from:

- Managing Mechanical CAD
- Managing ECAD and Software
- Providing the “lifeline” for communication for the company through Bill of Material transformation
 - CAD → SBOM → SBOM → SBOM
- Integrated Quality Management
 - From Design → Design Validation → Process Validation → Manufacturing
- Enterprise Product Change Management
 - Design → Manufacturing → Service
- Integration to ERP and MES
 - For transactional activities - Purchasing, Schedules, etc.

PDM to PLM Roadmap

PLM FOUNDATIONAL PHASE: Mechanical CAD, ECAD, Product Data Management, Change Management, Product Development, Product Realization, Product Support, Product Lifecycle Management.

PLM EXTENSION: Integrated Quality Management, Enterprise Product Change Management, Advanced Bill of Materials, Advanced Change Management, Advanced Product Support, Advanced Product Development, Advanced Product Realization, Advanced Product Support.

PLM is a journey that needs to evolve from managing Mechanical CAD to managing ECAD and Software and providing the “lifeline” for communication for the company through Bill of Material transformation while Integrating Quality Management and developing a method for Enterprise Product Change Management.

2. Using IoT to Level the Playing Field in Baseball

Current Ball Mudding Process

This process of mudding baseballs started in the 1950s. The mud used comes from the Delaware River located in South Jersey.

It's smooth—almost creamy—and when applied to a ball, it soaks right into the surface without drying out, improving the grip without creating too much discoloration.

The process is instructed as:

• Scoop base (finger) worth of mud. Paint it across the entire surface of the baseball. Rub the ball in between both hands for no more than 40 seconds.

However, there is more for interpretation.

Solution

Goal: Development of a repeatable, consistent and certified process for mudding baseballs in MLB.

Solution: Automate the process of applying this Magic Mud to the baseball. Certify that each ball going through the process is certified to the agreed upon standard that MLB has for the finished baseball. Provide MLB with certified artifacts for each baseball from each of the 31 baseball parks. Incorporation of Digital Imaging, Automated Controls and IoT Technology for gathering, certifying and providing certification artifacts to MLB.

Since the 1950s, the challenge in baseball has always been: Is the “correct” mudding amount being applied consistently? It has always been subjective and at the sole discretion of the MLB Home Club. How does MLB regain control and ensure that all baseballs used regardless of which park the game is being played are muddied equal to create a level playing field? Development of a repeatable, consistent and certified process for mudding baseballs in MLB by automating the process of applying this Magic Mud to the baseball and certifying that each ball going through the process is certified to the agreed upon standard that MLB has for the finished baseball. The solution incorporates Digital Imaging, Automated Controls and IoT Technology for gathering, certifying and providing certification artifacts to MLB.

The Automated Process

Ball Mudder's solution consists of five steps:

- Step One - Ball Induction and Disinfecting with UV light
- Step Two - Initial "Spray and Buff" with automated controls and using digital imagery for certification to 30% of the color of the finished and product
- Step Three - Final "Spray and Buff" with automated controls and using digital imagery for certification to 100% of the color of the finished product
- Step Four - Final Digital Inspection to certified MLB standard and Printing of Serial # with invisible ink to ensure authenticity
- Step Five - Ball Removal of "Unacceptable" Baseballs that do not comply to MLB standard (less than 3% - current results)
- Step Six - Ball Removal of "Certified" Baseballs that comply to MLB standard

Data Retrieval and Storage - IoT Connectivity to AWS Cloud for data storage and use by Ball Mudder APP

Technology Utilized

Ball Mudder's solution utilizes the following technology developed by DRIVEN-4:

- Higher resolution of ball induction including disinfecting with UV light
- Making partners with stepper speed control for high resolution speed distance, direction control, and speed
- "Spray and Buff" methods utilizing solid state controls and stepper motors for high resolution control of spray times and balling speed
- Machine Vision utilized to inspect each ball and certify it meets the criteria matching requirements of MLB.
 - In range to close to 90% of color ball
 - 27 frame to close to 200% of 10 of color ball
- Final digital inspection to verify objects also use pattern matching to prevent serial number with infrared ink
- Final inspection also for operators of "Unacceptable" Baseballs, "Certified" baseballs that comply to standard

Real report generated showing list of approved/unapproved baseballs, serial numbers, and environmental data (humidity, temperature) if desired.

Data Retrieval and Storage - IoT Connectivity to AWS Cloud for data storage and use by Ball Mudder APP

3. DRIVEN-4 Connected Solution - Hardware and Software Solution

The DRIVEN-4 Connect Solution provides the following:

1. Network Connections

- Wi-Fi, Cellular (LTE) | Antenna included (external available) and Bluetooth (provision/control)

2. System Communications

- GPS (daughter card), GPIO, ADC, SPI, I2C, Serial Ports (232/485/Custom) and Modem controlled GPIO (1.8V) | Cellular C2C

3. Firmware

- C based and Libraries (ADC, Analytics, Modem Control, Custom)

<https://driven-4.com/driven-4-connect-system>

We will be hosting an additional webinar in the 4th quarter—Stay tuned!

Next Month: The Enterprise Challenge— Best Methods to Manage your Data

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